



BBioNets

Boosting the adoption
of Bio-Based Technologies

Factors Driving the Implementation of BBTs: The Italian Case

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Article information

Title	Factors Driving the Implementation of BBTs: The Italian Case
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Brief summary	<p>As part of the Horizon Europe BBioNets project, this study evaluates the potential for implementing bio-based technologies (BBTs) in the Italian Forestry and Agricultural Network (FAN), which encompasses Liguria, Piedmont, and Valle d'Aosta. The project aims to identify FANs in Italy, Poland, Ireland, the Czech Republic, Spain, and Greece to promote the dissemination of knowledge on the valorization of agricultural and forestry biomass for BBTs. By analyzing the normative framework, structural assets, funding opportunities, and biomass resources, we assess the readiness of this area to support sustainable bio-based advancements.</p> <p>Findings indicate that the region demonstrates a solid alignment of regulatory support, infrastructural adequacy, and resource availability, culminating in a favorable outlook for BBT implementation. These results highlight the region's suitability for biomass valorization, underscoring its capacity to foster bio-based economic growth and contribute to broader sustainability goals.</p>
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Introduction: The Horizon Project BBioNets

The BBioNets project, “Creation and promotion of Forest and Agriculture Networks to boost Bio-Based Technologies adoption and Value Chain development”, aims to establish networks between agricultural entrepreneurs and local institutions to support the adoption of Bio-Based Technologies (BBTs). This initiative promotes the reuse of biomass to enhance climate resilience by reducing greenhouse gas emissions, advancing the circular economy, and adhering to zero-waste principles.

BBTs refer to technologies or practices that leverage non-food raw materials, circularity principles, or both, to produce alternative products compared to conventional ones.

The project involves six Forest and Agricultural Networks (FANs) located in Ireland, Spain, Greece, Italy, Poland, and the Czech Republic (Figure 1).

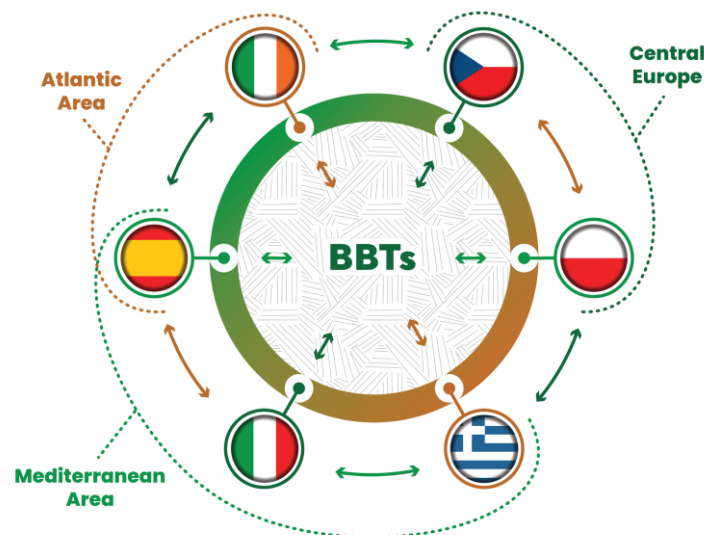


Figure 1: The BBioNets FANs.

These networks serve as catalysts for innovation and sustainability within their respective local ecosystems, engaging in a range of activities, including:

- Engaging regional stakeholders to identify specific local needs;
- Facilitating an understanding of the unique dynamics and practices in each region;
- Collaborating to co-design tailored and sustainable local solutions aligned with the principles of the circular bioeconomy and biotechnology.

Green Light for the Italian FAN: Assessing Regional Potential for Bio-Based Technologies Implementation

The regions of the partner countries in the project were classified based on their capacity to implement bio-based technologies (BBTs) using a traffic light system (Figure 2).



Figure 2: Traffic light system used to classify the regions of the partner countries.

A green light indicates that the country has both the economic resources and financial support necessary for BBT implementation, along with a regulatory framework that recognizes biomass valorization as a tangible measure for reducing carbon emissions. A yellow light signifies that the country meets only one of these criteria. Finally, a red light denotes a lack of capacity across all the variables considered. This article focuses on Italy, which has been classified as a "green light" country. The following sections provide an overview of Italy's status with respect to the three key variables analyzed for this classification: (i) bioeconomy and regulatory framework, (ii) biomass availability, and (iii) policies and financial support.

Bioeconomy and Normative Framework

Italy's regulatory framework strongly supports the bioeconomy and biomass valorization through initiatives like the National Bioeconomy Strategy (BIT, 2017; BIT II, 2019), promoting bio-based products, bioenergy, and waste valorization, while highlighting Italy's Mediterranean role via programs like PRIMA and BLUEMED. The National Energy Strategy (2017) and the National Plan for Energy and Climate (2021–2030) integrate bioenergy into renewable energy transitions, complemented by the National Adaptation Strategy and Plan emphasizing bioeconomy's role in clean energy and resource conservation. Financial tools like the EAFRD and platforms such as the SPRING Cluster foster agro-waste valorization and bio-based industries. Regional initiatives, including Piemonte's Bioeconomy Technology Platform and Liguria's BIOFAT project on microalgae cultivation, showcase industrial potential. Lastly, the National Strategy for the Circular Economy (2022) and Waste Management Programme target resource efficiency, such as wastewater reuse and soil rehabilitation, under the NRRP framework.

Biomasses Availability

In 2019, the bioeconomy contributed €103B in added value, representing 6.4% of the national total. The agri-food chain dominated, ranging from 46% in Central Italy to 78% in the South. In the North-

West, including the Italian FAN (Liguria, Piedmont, Valle d'Aosta), the agri-food chain accounted for 56%. At the regional level, Lombardy, Veneto, Emilia-Romagna, and Tuscany together generated over 50% of the bioeconomy's value.

In 2023, bioeconomy activities in Italy generated €437.5B (+2.2% from 2022), employing 2 million people. The agri-food chain remained the largest sector, contributing 60% (€276B) of the total, with employment concentrated in agriculture (44%) and food processing (24.9%).

Biomass availability studies estimate 25 Mtonnes/year of agricultural residues nationwide, though 78% is used in the zootechnical sector. In the Italian FAN area, agricultural waste contributed 2.85M tonnes of dry matter in 2022, primarily straw from Piedmont. Wood from forests accounted for 319,500 tonnes, with Liguria and Valle d'Aosta making significant contributions relative to their surface area.

Policies and Financial support

The Italian bioeconomy thrives on robust national and regional policies aligned with EU frameworks, fostering innovation and sustainability. The National Recovery and Resilience Plan (NRP) allocates €68.6B under Mission 2 "Green Revolution and Ecological Transition" to enhance sustainability and resilience. The Italian CAP Strategic Plan promotes ecological and digital transitions, agroecology, sustainable jobs, and rural heritage, focusing on youth and women.

The National Research Plan 2021–2027 prioritizes bioeconomy-related research, while Regional Smart Specialisation Strategies (S3) identify territorial strengths, such as biorefineries (Piedmont), biomass pre-treatment (Valle d'Aosta), and distributed biomass energy systems. Other focus areas include green chemistry, bioinformatics, biomedical solutions, and sustainable architecture.

Conclusion

In conclusion, Italy demonstrates a strong capacity to implement bio-based technologies, as reflected in its classification as a "green light" country within this study. Its well-established bioeconomy regulatory framework, substantial biomass availability, and robust policies and financial support position it as a leader in this field. With a comprehensive National Bioeconomy Strategy and regional initiatives fostering innovation, Italy integrates bio-based solutions into its energy transitions, circular economy, and resource efficiency goals. The substantial contribution of the bioeconomy to the national economy and employment underscores its pivotal role in sustainable development. By aligning national and regional policies with EU frameworks and prioritizing research and innovation, Italy not only advances its domestic bioeconomy but also sets a benchmark for other nations seeking to reduce carbon emissions and transition toward a sustainable future.

References

1. Basset F., Borsotto P., Cagliero R., Giarè F., Lai M., Mirra L. and Vagnozzi A. (2024) BBIONETS Deliverable D2.4- High-level study of the regional dynamics for the use of Bio-based Technology-ITALY.
2. I. Government (2019). A new Bioeconomy Strategy for a sustainable Italy - BIT II
3. MEF (2024), The National Recovery and Resilience Plan (NRRP) Available: <https://www.italiadomani.gov.it/en/home.html>. [Accessed on November 2024].
4. C. N. p. I. B. Intesa San Paolo (2022). La Bioeconomia in Europa 8° Rapporto, Intesa Sanpaolo – Direzione Studi e Ricerche.

Document information

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Project overview **BBioNets** will constitute a thematic network that will rely on, promote, and further advance the work carried out by EIP AGRI Operational Groups (OGs) with respect to **management and/or processing of agricultural and forest biomass with Bio-Based Technologies (BBTs)**. The project will set up 6 regional Forest and Agriculture Networks - FANs (IE, ES, IT, GR, PL, CZ) that will identify local needs, prioritise specific BBTs and share BBT knowledge ready for practice to farmers and foresters, boosting the (re)definition of value chains, stimulating cross-fertilisation beyond borders, and bringing Europe to the forefront of farming, forestry, and bioeconomy with economically viable and sustainable practices.

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